

WHAT IS CLAIMED IS:

1. A polymer gel composition, comprising: at least two polymer compounds which interact with each other to form a polymer complex; and a liquid, wherein

one of the polymer compounds forms a three-dimensional crosslinked structure;

at least one other polymer compound is compatible with the liquid; and

at least a portion of the compatible polymer compound is included in the three-dimensional crosslinked structure.

2. A polymer gel composition according to claim 1, wherein the polymer complex is reversibly disassembled by a stimulus so that the polymer compound forming the three-dimensional crosslinked structure exhibits a change in volume by absorbing or releasing the liquid.

3. A polymer gel composition according to claim 1, wherein the three-dimensional crosslinked structure is in a particle shape.

4. A polymer gel composition according to claim 2, wherein the stimulus is heat.

5. A polymer gel composition according to claim 1, wherein the polymer complex has a phase transition temperature of -5°C to 80°C.

6. A polymer gel composition according to claim 1, wherein at least one of the polymer compounds forming the polymer complex includes a carboxylic amide group, and at least one other polymer compounds includes a carboxyl group.

7. A polymer gel composition according to claim 1, wherein the polymer compound forming the three-dimensional crosslinked structure has at least one ionic substituent.

8. A polymer gel composition according to claim 1, wherein a portion of the polymer compound compatible with the liquid has a crosslinked structure.

9. A polymer gel composition according to claim 1, wherein a portion of the polymer compound compatible with the liquid has a continuous crosslinked structure, which includes a plurality of polymer compounds forming the three-dimensional crosslinked structure.

10. A polymer gel composition according to claim 1, further comprising an additional polymer compound including

a continuous crosslinked structure, which contains a plurality of the three-dimensional crosslinked structures and at least one polymer compound which interacts with the three-dimensional crosslinked structure to form a polymer complex.

11. A polymer gel composition according to claim 1, wherein the polymer compound forming the three-dimensional crosslinked structure includes a light-modulating material.

12. An optical device, using a polymer gel composition, the polymer gel comprising: at least two polymer compounds which interact with each other to form a polymer complex; and a liquid, wherein

one of the polymer compounds forms a three-dimensional crosslinked structure;

at least one other polymer compound is compatible with the liquid; and

at least a portion of the compatible polymer compound is included in the three-dimensional crosslinked structure.

13. An optical device, comprising: a pair of substrates; and a polymer gel composition disposed between the pair of substrates, ends to the substrates being sealed, wherein

the polymer gel composition comprises: at least two polymer compounds which interact with each other to form a polymer complex; and a liquid, and one of the polymer compounds forms a three-dimensional crosslinked structure;

at least one other polymer compound is compatible with the liquid; and

at least a portion of the compatible polymer compound is included in the three-dimensional crosslinked structure.